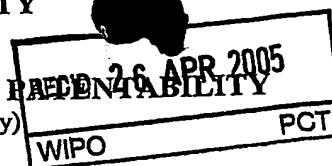


PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)
(PCT Article 36 and Rule 70)



Applicant's or agent's file reference 634099C	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/AU2004/000594	International filing date (<i>day/month/year</i>) 7 May 2004	Priority date (<i>day/month/year</i>) 9 May 2003
International Patent Classification (IPC) or national classification and IPC Int. Cl.⁷ H01L 21/68		
Applicant ORIGIN ENERGY SOLAR PTY LTD et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of **5** sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☐ (*sent to the applicant and to the International Bureau*) a total of sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input checked="" type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 25 November 2004	Date of completion of the report 15 April 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer RAJEEV DESHMUKH Telephone No. (02) 6283 2145

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1 (b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☐ the description:

pages as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

☐ the claims:

pages as originally filed/furnished
pages* as amended (together with any statement) under Article 19
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

☐ the drawings:

pages as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
☐ the claims, Nos.
☐ the drawings, sheets/figs
☐ the sequence listing (*specify*):
☐ any table(s) related to the sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
☐ the claims, Nos.
☐ the drawings, sheets/figs
☐ the sequence listing (*specify*):
☐ any table(s) related to the sequence listing (*specify*):

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. IV Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has:
- ☐ restricted the claims.
 - ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☐ neither restricted nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
 - ☒ not complied with for the following reasons:
Please see the Supplemental Box.

4. Consequently, this report has been established in respect of the following parts of the international application:

- ☒ all parts.
- ☐ the parts relating to claims Nos.

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1-65	YES
	Claims	NO
Inventive step (IS)	Claims 1-65	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-65	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

US 6 231 673 B1 (MAEDA) 15 May 2001

WO 2002/045143 A1 (AUSTRALIAN NATIONAL UNIVERSITY) 6 June 2002

US 6 106 222 A (TSUJI et al.) 22 August 2000

US 4 443 652 A (IZU et al.) 17 April 1984

EP 0 111 394 A2 (ENERGY CONVERSION DEVICES, INC.) 20 June 1984

US 4 617 420 A (DILTS et al.) 14 October 1986

WO 2000/077860 A2 (POWERTILE LTD) 21 December 2000

NOVELTY (N), INVENTIVE STEP (IS) CLAIMS 1-65

The claims are novel, involve an inventive step, and are industrially applicable because they all incorporate the "sliver cell technology" disclosed in WO 2002/045143; and that document does not disclose or (individually or in obvious combination with another cited document) suggest the inventions as claimed in the present application. In "sliver cell technology", the semiconductor wafer is cut into strips such that the thickness of the wafer becomes the width of the strips, and such that the thickness of a strip is less than its width. Therefore the thickness of the slivers is less than the thickness of the initial wafer. The positive indication with respect to novelty and inventive step is due to the incorporation of the "sliver cell technology" in the present claims. While the additional operations such as vacuum pick-up, conveying, and assembling are known *per se*, it is not evident that the combination of the "sliver cell technology" with these known operations would be obvious to a person skilled in the art.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box No. IV

The international application does not comply with the requirement of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a general inventive concept. In coming to this conclusion the International Searching Authority has found that there are at least three inventions as indicated against the nine independent claims below:

Claim 1: A method of separating strips comprising applying vacuum, and displacing the wafer.

Claim 10: An apparatus for separating strips comprising a vacuum source, and a displacement means.

Claim 19: A method of assembling strips comprising receiving a strip on a belt, moving the belt, repeating the sequence.

Claim 28: An apparatus for assembling strips comprising a belt, a motor and a controller.

Claim 37: A method of assembling strips comprising applying adhesive material, applying vacuum to maintain the strips in an array, transferring the strips, ceasing the vacuum.

Claim 41: An apparatus for assembling an array of strips comprising a means to apply an adhesive, a means to apply vacuum, a means for transferring, a means to cease applying vacuum.

Claim 45: An apparatus for assembling an array of strips comprising separating a strip, displacing the wafer, receiving strip on a belt, moving the belt, repeating the sequence.

Claim 54: A system of assembling an array of strips comprising a vacuum source, a displacement means, a belt, a motor and a controller.

Claim 63: A device comprising a substrate, an array of strips and an adhesive material.

The features common to these claims have been disclosed in WO 02/45143 discussed in the application. There appear to be at least three special technical features contained in the above claims: (1) a vacuum source and associated displacement means, (2) belt, motor and controller, and (3) adhesive means on the substrate. These technical features appear to be present in various combinations (along with other features) in the above claims. Consequently there are three inventions in the present application. The requirement of unity of invention is not satisfied *a posteriori*.